Empire Water-Power.

Water-Power in the British Empire. The Reports of the Water-Power Committee of the Conjoint Board of Scientific Societies. Pp. ix+54. (London, Bombay, and Sydney: Constable and Co., Ltd., 1922.) 3*s.* 6*d.* net.

IT is just about twelve months since reference was made to the third and final Report of the Water-Power Committee of the Conjoint Board of Scientific Societies (NATURE, December 8, 1921, p. 457). In the little book before us the whole of the results of the investigations made by the committee, as set forth in the three successive reports, are embodied. This compact statement of the present position of the British Empire in regard to the development of its water-power resources will be welcome to all who are interested in the matter, either from a purely scientific or from a utilitarian and practical point of view. It represents the outcome of four years of valuable research work, carried on with unremitting activity by the committee under the capable direction of the chairman, Sir Dugald Clerk, and with the energetic and painstaking assistance of the secretary, Prof. A. H. Gibson.

Sir Dugald Clerk contributes to the volume a preface of a very thoughtful and stimulating character. He tells us that the 46 million people now living in the United Kingdom require an expenditure of energy of 10½ million horse-power for their support, and that while this supply of power is undoubtedly forthcoming, for the present, from our stock of coal, yet our reserves of natural fuel are bound to diminish, and in time to be depleted, so that we shall be obliged to fall back upon other agencies to make good the deficit. Taking the United Kingdom as a whole, there appears to be continuously available (24 hour period) a total of 1,350,000 horse-power, or if any great tidal scheme, such as that of the Severn, be included, perhaps a total of 1,750,000 horse-power. This is, of course, insufficient to replace the work done by means of coal-fired engines, but, at least, it would represent a very substantial saving in fuel.

On the other hand, this power is not all economically realisable, or rather the cost of obtaining the whole of it would be higher than is justified, as yet. In Scotland, however, some 183,000 horse-power is immediately feasible, at a cost appreciably less than that of coal-fired stations built and operated under existing conditions. Even in England and Wales, a large proportion of the quota is commercially obtainable. It is obviously a matter, then, of national concern to devise means for making use of these natural power supplies, which are running to waste, if only for the purpose of supplementing the work which is at present done by our far from inexhaustible supplies of coal.

The report covers a wider field than Great Britain; it embraces the resources throughout the British Dominions, and its carefully compiled figures will be of considerable assistance to those whose interest lies in the promotion of water-power schemes at home or abroad.

BRYSSON CUNNINGHAM.

Our Bookshelf.

Modern Electrical Theory. Supplementary Chapters. Chapter XV.: Series Spectra. By Dr. N. R. Campbell. (Cambridge Physical Series.) Pp. viii+110. (Cambridge: At the University Press, 1921.) 10*s.* 6*d.* net.

THE work now before us is one of the supplementary chapters to Dr. Campbell's book on modern electrical theory. This series of supplements is planned according to an idea which might well be used by the authors of other text-books on physics. It is unfortunate, however, that we are unable to commend the present book to those who, like the reviewer, welcomed the author's original work as a real and vital account of the subject. The book contains numerous errors which any practical spectroscopist would detect at once; and they reach their culminating point when the author, in a professedly complete list of the chemical elements the spectra of which form well-defined series, omits oxygen, sulphur, and selenium. The spectrum of oxygen is, almost in a classical sense, one of the most beautiful and ideal series arrangements known to every spectroscopist. It has not played a part in the application of the quantum theory as yet, which may provide the explanation of the circumstance that the author is unaware of this fact, as he shows more than once.

The genesis of this book is quite clear. The author has read Bohr's recent work on the "Correspondence Principle," and, like every other reader, has been very much attracted by it. He has also consulted all the Danish and German writings, and he gives a really excellent account of them in a very non-technical style. Dr. Campbell appears, however, to be unaware of the contribution of this country to the subject, and of the practical details of spectra. The second deficiency explains why all the facts of spectra which he gives correctly are those which foreign writers have quoted in support of the quantum theory. Following the usual assumption that all the significant work on the subject has been done abroad, anything written in English is mostly ignored or misquoted. It is difficult, indeed, to find an English name in the whole work. A treatise on any branch of this subject which never refers to the fundamental work of Jeans, dismisses that of Fowler with a casual mention of his least important contribution, credits Nicholson with a mere suggestion that the angular momentum in an atom might have discrete values, and finally never mentions W. Wilson, who anticipated Sommerfeld in the fundamental generalisation, while putting it on a

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real dynamical basis, as Sommerfeld himself has admitted in his latest edition, excites both surprise and regret. Except from one point of view, the work is misleading and inaccurate in detail. What it does give is a condensed summary of foreign work, which is excellent if read at the same time as a compendium of the actual experimental facts of spectra.

Air Ministry: Meteorological Office. The Weather Map. An Introduction to Modern Meteorology. By Sir Napier Shaw. Fifth issue (reprint of fourth). (M.O. 225*i*.) Pp. 109 + 8 plates + 8 charts. (London: H.M. Stationery Office, 1921.) 1*s*. 3*d*. net.

It is not possible to overestimate the high value of this work. At the present time the demand for weather knowledge is very keen, the enthusiasm being stimulated by the wireless broadcasting of weather information. To appreciate fully the information received by wireless it is essential to be able to grip intelligently the scientific details involved. The work under review contains much general information on meteorology. The former edition was issued four years ago, and the earlier copies gave much assistance in the training of meteorological units in the army, so essential for many interests during the war.

The publication contains specimen weather maps, and the letterpress thoroughly explains their construction and the results which the maps provide. Weather systems and their movements are dealt with and explanations are given of the sequence of weather, the travel of the centres of disturbances, and the veering and backing of the wind. Recent research relative to the upper air is incorporated, and a thorough understanding can be secured of the distribution over the British Isles of cloud and rain consequent on the passage of a storm area across the country. Information is given as to averages and normals, and the numerous tables, diagrams, and maps in the latter half of the book are useful for reference. The cost of the earlier editions of the work was 4*d*., but the charge, 1*s*. 3*d*., for the present issue is exceedingly small, and the work should be obtained by all who would be meteorologists. C. H.

Rocks and their Origins. By Prof. Grenville A. J. Cole. (Cambridge Manuals of Science and Literature.) Second edition. Pp. viii + 175. (Cambridge: At the University Press, 1922.) 4*s*. net.

It speaks well for the discrimination of the readers of popular science that a new issue of this thoughtful introduction to the study of rocks should be called for. Prof. Cole is equally at home in tracing the history of the development of scientific theories and in describing the relation of scenery to the geological structures of the rocks that underlie it. He discusses without too much technical detail the origin of the different types of rocks of which the earth's crust is composed, and gives a very fair résumé of the controversies which have been waged on the subject, many of which are still as active as ever. There are a number of happily chosen illustrations of rock scenery, mostly reproduced from the author's own photographs. This little volume is honourably distinguished from others of a similar character by the clearness of its style and the abundant references which will prove useful in directing the student's attention to scientific contributions that he might otherwise overlook. There are few of our geologists who have read so widely and to such good effect as Prof. Cole. J. W. E.

Farm Book-Keeping: The Principles and Practice of Book-Keeping applied to Agriculture: for Agricultural Colleges, Extension Classes, Evening Classes, and Practical Farmers. By John Kirkwood. Pp. 224. (Edinburgh: W. Green and Son, Ltd., 1922.) 6*s*. net.

One of the most noteworthy developments in the study of agriculture is the attention which is now paid to the economic aspects of farm working. Mr. Kirkwood's book (one of the Scottish Series of Junior Agricultural Text-books) is to be welcomed as a work which contributes to this development.

Part I. consists of nineteen concise chapters dealing with double-entry book-keeping in its application to farm management. Part II. sets forth a simple cash-book system for the benefit of those who may regard double-entry as a complicated system, and the author assures us that his simplified method of keeping accounts has stood the test of actual use.

With practical handbooks of this kind on the market there can be no excuse for the repetition of those blunders in farm management which are the accompaniment of a disregard for scientific study and a blind adherence to tradition.

Coal-tar Colours in the Decorative Industries. By A. Clarke. Pp. xiii + 166. (London: Constable and Co., Ltd., 1922.) 6*s*.

The uses of coal-tar dyestuffs in lake-making, and in leather, fur, wood, paper, etc., colouring—*i.e.* those applications which are not covered in the ordinary treatises on fabric dyeing—are considered in Mr. Clarke's work. The treatment is, naturally, wholly technical, and very brief. A bibliography is given. To the expert the treatment will doubtless appeal, but to the ordinary scientific reader such sentences as the following indicate a language even more formidable than his own: "The level-dyeing acid dyestuffs do not exhaust well, but if they are topped with basic colours the backwaters are colourless." A glossary might have been added for the uninitiated.

The Peoples of Europe. By Prof. H. J. Fleure. Pp. 110. (London: Oxford University Press, 1922.) 2s. 6d. net.

It was no mean task to attempt an adequate sketch of European peoples in about a hundred pages, but Prof. Fleure has been fairly successful. His volume is opportune at a time when a sound scientific basis for the discussion of the complex problems of Europe is essential, and it is a happy illustration of the value of a geographical foundation in the study of political problems. The book contains not only a great amount of information but also a wealth of ideas, and is a genuine contribution to the vexed questions of the time. There are three sketch maps and a short but useful bibliography. The lack of an index is unfortunate. R. N. R. B.

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